

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

09247-081099

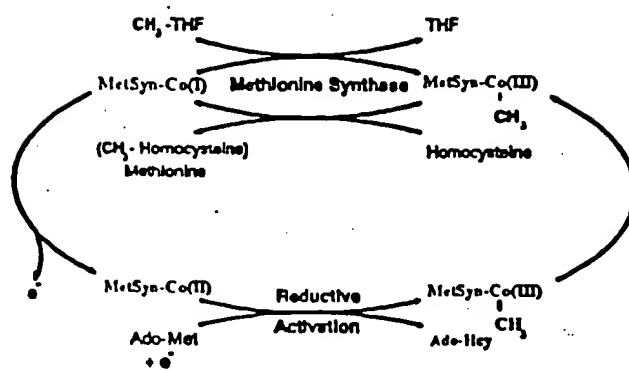


FIG. 1

550780" 24ET 2E60

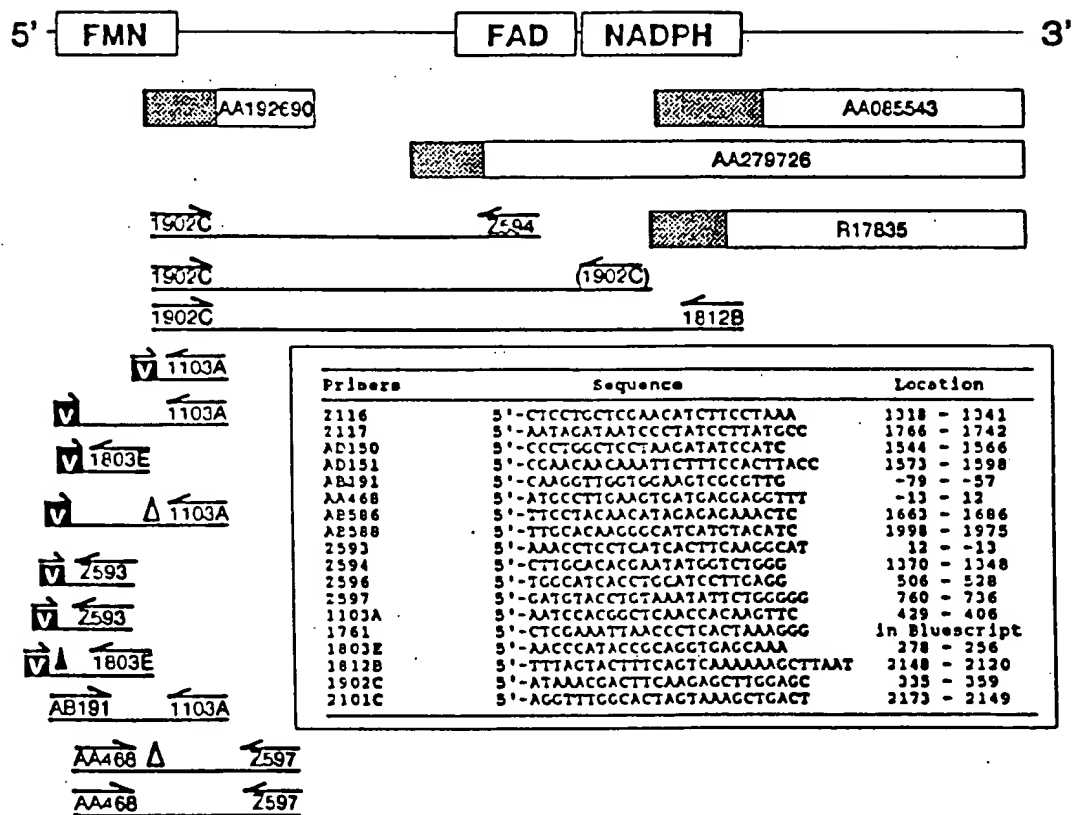


FIG. 2

CAAGGTTGGTGAAGTCCGTTGTGAGGTTCCGTGCCCGCTGGCGGGCGTGGTTTCACTGTTACATGCCCTTGAAGTG
1 ATGAGGAGGTTTCTGTTACTATATGCTACACAGCAGGACAGGCAAGGCCATCCGACAAGAAATGTGTGAGCAAGCTGTGGTACATGGATTTTCTGCAGATCTTCACTGTAATTAGTGAA
MRRFLLLLYATOOOGAKAIAEEMCEQAVVHGFSAADLHCISE 40
121 TCCGATAAGTATGACCTAAAAACCGAAACAGCTCTCTTGTGTTGTGGTTTCTACCCAGGCGACCCGACACAGCCCGCAAGTTTGTAAAGGAAATACAGAACCAACA
SDKYDLKTEETAPLVVVVSTTGTGGDPPDTARKKFVKEIQNOT 80
241 CTGCGGTTGATTTCTTGTCTACCTGCGGTATGGGTACTGGGTCTCGGTGATTGAGAATACACCTACTTTTGAATGGGGGGAAGATAATGATAAACGACTTCAAGAGCTTGGAGCC
LPVDFFAHLRYGLLGLGDSEYTYFCNCGGKIIDKRLQELGA 120
361 CGGCATTTCTATGACACTGGACATGCAGATGCTGTAGGTTTACAACCTGTGGTGTGAGCGGTGATTTGCTGACTCTGCCAGCCCTCAGAAAGCATTITAGGTCAAGCAGAGGACAA
RHFYDTGHAADD CVGLELVVEPWIAGLWPAALRKHFRRSSRGQ 160
481 GAGGAGATAAGTGGCGCACTCCCGGTGGCATCCTTGCATCCTTGAGGACAGCCTTGTGAAGTCAGAGCTGCTACACATTGAATCTCAAGTCGAGCTTCTGAGATTGATGATTGAGGA
EEISGALPVASPASLRTDLVKSELHIESQVELLRFD DSG 200
601 AGAAAGGATTCTGAGGTTTGAAGCAAAATGCAGTGAACAGCAACCAATCAATGTTGTAAGACCTTTGAGTCTCACTTACCGTTCCGTACCCCACTCTCAAGCCCTCTCTG
RKDSEVLKQNAVNNSHNSNVVIEDFESSLTSVPPLSQASL 240
721 AATATCTCGTTTACCCCAAGATAATTACAGGTACATCTGCAGGAGTCTTGGCCAGGAGGAAAGCAAGTATCTGTGACTTCAAGCAGATCCAGTTTTCAGTCCCAATTTCAAAG
NIPGLPPEYLOVHLQESLGOEESQVSVTSADPVPVFPVPSK 280
841 GCAGTTCAACTTACTACCAATGATGCCATAAAACCACTCTGCTGGTACAATTGGACATTTCAAAATACAGACTTTTCTATCAGCTTGGAGATGCCCTCAGCGTATCTGCCCTAACAGT
AVOLTTNDIAIKTTLVLELDISNTDFSYPGDAF SVICPN S 320
961 GATTCTGAGGTACAAGCCTACTCCAAGACTGAGCTTGAAGATAAAGAGAGGACCTGCTCTTTTGAATAAAGGAGACACAAAGAAAGGAGCTACTTACCCAGCAGTATA
DSEVOSLLORLQLEDKREHCVLLKIKADTKKKKGATLPQHI 360
1081 CCTGCGGGATGTTCTCTCCAGTTCAATTTTACCTGGTGTCTTGAATCCGAGCAATTCCTAAAGAGGCAATTTTGGGAGCCCTTGTGGACTATACCAGTCACAGTCAAAAAGCGCAGG
PAGCSLQOFIFTWCLEIRAIIPKKAFLLRALVDYTS DSAEKRR 400
1201 CTACAGGAGCTGTGAGTAAACAAGCGCGAGGATTATAGCCGCTTGTACGAGATGCCCTGTGCTGCTTGTGGATCTCTCTCTCGCTTCCCTTCTTCCGAGCCAGCCTCAGTCTC
LOELCSKQGAADYSRFRV RDAACA CLLDLLLA FPPSCOPPLSL 440
1321 CTGCTCGAATCTTCTTAACTTCAACCCAGACCATATTCTGTGCAAGCTCAAGTTTATTTCAACCGAAGAGCTCCATTTTGTCTTCAACATTTGCGAATTTCTGTCTACTGCCACA
LLEHLPKLOPRPYSCASSSLFHPGKLFVFNIVEFLSTAT 480
1441 ACAGAGGTTCTCGGCAAGCGAGTATGTACAGCTGGCTGGCTTGTGGTGTCTTCACTTCTCAGCCAAACATACATGCCATCCCATGAACAGACGGGAAAGCCCTGGCTCCTAAGATA
TEVLRKKGVCCTGVLLALLVASVLOPNIHASHEDSGKALAPKI 520
1561 TCCATCTCTCTCGAACAACAAATTTCTTCCACTTACCAGATGACCCCTCAATCCCATCATATGTTGGGTCAGGAACCGGATAGCCCGCTTATTTGGGTCTTACAACATAGAGAG
SISPRITINSFHLPPDPSIP IIMVGP GGTGIAPIFGFLOHRE 560
1681 AAACCTCAAGAACACACCCAGATGCAAAATTTGGAGCAATGTGGTTGTTTTGGCTCAGGCAAGGATAGGATTTCTATTTCAGAAAGAGCTCAGACATTTCCITTAAGCATGGG
KLOEQHMPDGNFGAMWLF FFGCRHKDRDYLF RKELRHF LKHG 600
1801 ATCTTAATCTCTAAAGTTTCTTCTCAAGATGCTCTGTGGGAGGAGGAAGCCCGAGCAAGTATGTACAAGACAACATCCAGCTTCTGCGCAGCAGGTGGCGAGAAATCCTC
ILTHLKVSPSRDAPVGE EAPAKYVQDN IQLHGGOVARIL 640
1921 CTCAGGAGAACGGGCATATTATGTGTGGAGATGCAAGAAATATGGCCAGGATGTACATGATCCCTTGTGCAAAATAAAGCAAGAGGTTGGAGTTGAAAACATAGAAGCAATG
LOENGNIYVCGDAKHNHAKD VHDALVQ IISKEVGVKLEAM 680
2041 AAAACCTTGGCCACTTTAAAGAGCAAAAGCGTACCTTACAGGATATTGCTCATAAACAGAAATTAAGAAAGAGGATTAAAGCTTTTTTGACTGAAGTACTAAAGTCAGCTTTAC
KTLATLKEEKRYLQDIWS*** 698
2161 TAGTCCCAACCTTTAAATTTTCAAAACAAAATTTCTTCAACATTTCTTGAAGGACATGGAGTGGAGATTGGATCATTTAACAATAAACAACCTTCTGATTGATTTACGTATC
2281 TTTATCTACGCCCTTCTGTGCTGTGACTCTCCCAAAATTTGCCCTGTGCTTGTGAGCTCTTCTGAGCTAAAGGAGCCCTTCACTCCCTATCAGCGCCCTCTTACTTCCAGAGAACT
2401 TCACAGAGACTCTGCTCTTCCATGCAAAAGGCTTCTGAAATAGGGGAGACTGACTGAGTACCTCATTTCTGTGACTTACAGTGCCAACTTTAAAAAGTATGAAATGATTTATTTTA
2521 TATGATGATACCCATAAAGATGCTCATATTAATGTACTTAAATACACATGTAGAGCATATCTGTTATATGTTTATGTAATATCAAAATGCTTATTTGTTACTAAAGCTATATTTCTG
2641 ATAAAAATATTTAGGATAATTCCTACACAGGATTTATTTTATGATGCTGGGAAATATGAATGATTTTAAAAATTTCACTCTGGGCATATGGATTATCTATCACCATTACTTTT
2761 TTTAAGTCACAAATTCAGAAATTTGGGACATTTGCATTCATTTACAGGTACAGTACGTACATATTTAATAGAAAGATACAACTTTTTTATTTTCACTCTTTTATTTCTGCTGCTT
2881 GGCACATTTTGTGTTTTCCACATTTTGTCTCCATGATACCACTCAAGCAGTGTGCTGACCTAAAAATCTGACTTTAGTTAGTATCCTTGGATTTTATAGATTTCCCCAGTGTCTAAT
3001 TCCCTGTTATAATTTGCACAAACAAAATGTTATGATAATCTTCTCCACTGTTCTAATATATATTTTATTTGATAGCTTGGGATTAAACATCTCTGTTGAGGCTTT
3121 TGATCCTTTTGAAGAAATAAGATCTGAAGAAATGGCATAATCTTAAAAAATAAAAA

FIG. 3 page 1 of 2

HsMTRR	.....
CeMTRR	.....
HsCPR	MGDSHVDTSSTVSEAAVEVSLFSMTOMILFSLIVGLLTYWFLFRKKKEE	50
HsMTRR	.....FMN.....	
CeMTRR	.....MRRFLLLYATCGGCAKIAEEMCE	24
HsCPR	.....MTDFLIATGCTGCAETIARSLKE	24
	VFETFKICTLTSVRESFVEKMKKTGRNIIIVYCSOTGTAEEFANRLSK	100
HsMTRR	.....FMN.....	
CeMTRR	CAVVGCFIADLNCISESDK-YDKT-----ETAPLVVVVSTIGTGGPP	66
HsCPR	NAELTGLTFRHLHCEHEKKFNLNE-----EKLC-AIVVESTGCGGAP	66
	DAHRYG----HRCMSADPEETOLADLSSLPEDNALVVFCHATTYCGOPT	146
HsMTRR	.....FMN.....	
CeMTRR	CTAFKIVKICNCTLPVDFFAHLRYGLLGLGSEYTYTCNGCKIIOKRLQ	116
HsCPR	DNCAPIVERINRHELENEYLNLDYVLLGLGSMYESTYCTIFRRIKOLY	116
	DNADDTYDVLCEYDVO---LSCVKFAVGLCKNTYENFNAMCKYVOKRLE	193
HsMTRR	.....
CeMTRR	ELGARNFYDTGHADDCVGLLELVPEWIAGLVAFALRKHFRSFCOEIISGA	166
HsCPR	ALCANFLIDRAEADDCVGLLELVPEWIEFFATLASRFIDISADKHN----	162
	CLGACRIFELCLGDCGCLLEEDFITUREGFAVAVCEHF-----GV	233
HsMTRR	.....
CeMTRR	LFVASFALRTDLVKSELLNIESOVELL--RFDCSGKDCSEVLKCNVNS	214
HsCPR	-ATTESEMLKLNCKVTE----EKKALLCKRIEDEESDDEGRGVICID-	206
	EATGEESISCTEL-----VVHTDIDAAKVMGEMGRKASYEN	271
HsMTRR	.....
CeMTRR	NCSNVVIEDF---EESLTRSVPLS-CASLNIPGLPPEYLOVHLCESLGO	260
HsCPR	---MLIFEMTYDIFEISLLKGSOTLSNDEHLRVPAPGPFIVSSVSNEKLP	253
	CKP-----FFD-----AKNPFLLAAVTNKKLN	293
HsMTRR	.....
CeMTRR	EESCVS-----VTSADPVFCVPISKAVOLTY--NDAIKTLLEVLDIS	301
HsCPR	EDTKLEVMCLCKNFCVTKFFVLVVSFAEFTDPTSKIRKMTIVDFG	303
	CGTE-----FNLHMLELD	306
HsMTRR	.....
CeMTRR	N---TDFSTYCPGCAFVVICPMSDSEVCSLLOR-LOLEDKRENCVLLKIKAD	348
HsCPR	DNAELCTYFCDAITYFCVNPALVNFILKRCGVLDIADOCCEL-SINPK	352
	ISCSKIRYISGDNVAVTPANDSALVWOLCK---ILGADLD--VYNSLHNL	351
HsMTRR	.....
CeMTRR	TKKXGATLPCHIFACCSLOFIFTVLEIRAIKKAFLRALVDTTSCSAEK	398
HsCPR	TEKIMADIFCHVHKITLHNMITTCIDIRRAFGRPLIRVLAESTDFNEK	402
	DEESNKKHF--FCPTSYRTALTYTIDITNPFRTNVLTELACTASEFSEQ	399
HsMTRR	.....
CeMTRR	RPLOEL--CSYCGAADYSRFVRDACCLLDLLAFSPCOPPLSLLLENLP	446
HsCPR	FPLELE--CSACGMKDFIDFVRTPCLSLADHLFAFPNVKPPVDRLIELLP	450
	ELLKRNHSSSGCKELYLSVVVEARRHILAILODCPSLRPFIDHLCCELL	449
HsMTRR	.....FAD.....FAD.....FAD.....	
CeMTRR	RLCPKFTSCASSSLFHFGKLNFFVNIVEFLSTATTEVLKRCVETGWLALL	496
HsCPR	RLIPKFTSMSS---YENRKARLITYSENEFPATOGRRHSRKLATDVLNLS	497
	RLGARTYSIASSSKVHPNSVHICAVVYETKAGR--INXGVATHVL---	494
HsMTRR	.....
CeMTRR	VASVLOPHINASHEDSCKALAPKISIPRTINSFNL-----DOPSTP	539
HsCPR	R-----IGDKVOVLKEFAFRFLPLGHTKNSACKLP	529
	RAKE-----FVGENGGRALVPMFVRKSQRLPFK-----ATTP	527
HsMTRR	.....NADPH.....	
CeMTRR	ITMVCPGTGTAFFIG/LCHREKLCEONPDGNGAMU-LFFGCRNKDRDYL	588
HsCPR	LLMVCPGTGVSFVLSFLHFLRKLKDSFSDFVDPVRLFFGCRSSVDAL	579
	VIMVCPGTGVAFFIGFIOERAULROCKE---VGETLLTYCGRRSDEDYL	574
HsMTRR	.....NADPH.....NADPH.....	
CeMTRR	FRKELRNFLKNGILTHLKVSTSRDAFYCEEAFARTYVDONIOLNGOCVAR	638
HsCPR	YHSELEMFVSEGITDLIICESE-----KGERVDCGLRKYLDKVLP	621
	YREELAGFARDGALTOLNVAFSRE-----GSHKVTYVHLLKODREHLVK	618
HsMTRR	.....NADPH.....	
CeMTRR	ILLOE-NGHITYCGDAKNHAKDVNDALVQIISKEVGVKLEAMKTLATLK	687
HsCPR	FLTASTESKIFICGDAKNSKDVOCFSDIVASDOGIPDLEAKKLMOLK	671
	LI--EGGANITYCGDARNHARDVONTFYDIAVELGAMENAGAVDTIKKLM	666
HsMTRR	.....NADPH/FAD.....	
CeMTRR	EEKRTLODIWS	698
HsCPR	KSDGYIEDVWG	682
	TKGRYSLOVWS	677

FIG. 4 page 1 of 2

HsMTRR	.....	50
CeMTRR	.....
HsCPR	.....
	FMN	
HsMTRR	.....MRRFLLLYATOOGOAKAIAEEMCE	24
CeMTRR	.....MTDFLIAFGSOTGOAETIAKSLKE	24
HsCPR	VPEFTKIOTLTSSVRESSFVEKMKKTKGRNIIVFYGSOTGTAEFANRLSK	100
	
	FMN	
HsMTRR	QAVVHGFSADLHCISESDK-YDLKT-----ETAPLVVVVSTTGTGDDP	66
CeMTRR	KAELIGLTPRLHALDENKKFNLNE-----EKLC-AIVVSSITGGGDAP	66
HsCPR	DAHRYG---MRGMSADPEEYDLADLSSLPIDNALVVFCHMATYGECDPT	146
	
	FMN	
HsMTRR	DTARKFVKEIQNOTLPVDFFAHLRYGLGLGDSSEITYFCNGGKIIDKRLQ	116
CeMTRR	DNCARFVRRINRNSLEWEYLKNDYVLLGLGDSNYSSYQIIPRKIDKLT	116
HsCPR	DNAODFYDWLOETDVO---LSGVKFAVGLGNKTYEHFNAMGKYVDKRL	193
	
HsMTRR	ELGARHFYDTGHADDCVGLLEVPEWPIAGLWPAIRKHFSSRGOEIISGA	166
CeMTRR	ALGANRLFDRAEADDVGLELEVPEWIEKFATLASRFDISADKMN----	162
HsCPR	OLGAORIFELGLGDDGNGLEEDFITUREOFWPAVCEHF-----GV	233
	
HsMTRR	LPVASPASLRDVLKSELLHIESOVELL--RFDDSGRKDSEVLKONAVNS	214
CeMTRR	-AITESSNLKLNOKVTE----EKKALLOKRIEDEESDDEGRGRVIGID-	206
HsCPR	EATGEESSIRQYEL-----VVHTDIDAAKVYMGEMGRKLSYEN	271
	
HsMTRR	NCSNVVIEDF---ESSLTRSVPLS-OASLNIPGLPPEYLOVHLQESLQ	260
CeMTRR	---MLIPEHYDYPEISLLKGSQTLNDENLRVPJAPOPFIVSSVSNRKL	253
HsCPR	OKP-----PFD-----AKNPFLAAVTINRKL	293
	
HsMTRR	EESOV-----VTSADPVFOVPISKAVOLTY--NDAIKTLLVELDIS	301
CeMTRR	EDTKLEWNLCKMPGVVTKPFVFLVSSAEFVTDPFSSKIKTKRNIYVDFG	303
HsCPR	OGTE-----RHLMLHLELD	306
	
HsMTRR	N--TDSYQPGDAFVSPICPNSDSEVCSLLOR-LOLEDKREHCVLLKIKAD	348
CeMTRR	DHAAELOYPEGDATYFCVPNPALEVNFIKRCGVLDIADDOCEL-SINPK	352
HsCPR	ISDSKIRYESGDHVAVYPANDSALVNOLGK---ILGADLD--VVMNLNL	351
	
HsMTRR	TKKKGATLPQHIPAGCSLOFIFTWCLIRAIPKKAFLRALVDYTSDSA	398
CeMTRR	TEKINAQIPGHVHKITTLRHMTTCLDIRRAPGRPLIRVLAESTSDPNEK	402
HsCPR	DEESNKKHP--FPCPTSYRTALTYLDITNPRTNVLYLACAYSEPSEQ	399
	
HsMTRR	RRLOEL--CSKOGAADYSRFVRDACACLDLLLAFPS COPPLSLLHLP	446
CeMTRR	RRLLLEL--CSAOGMKDFTDFVRTPLGLSLADMLFAFPNVKPPVDRLIELLP	450
HsCPR	ELLRKMASSSGEGKELYLSWVEARRHILAILODCPSLRPPIDHLCCLLP	449
	
	FAD FAD FAD	
HsMTRR	KLOPRPYSACSSSLFHPGKLHFVFNIVEFLSTATTEVLKRGVCTGWLALL	496
CeMTRR	RLIPRPYSMS--YENRKARLIYSEMEFPATDGRHRSRKGLATDWLNSL	497
HsCPR	RLQARYYSIASSSKVHPNSVHICAVVVEYETKAGR--INKGVATNWL---	494
	
HsMTRR	VASVLOPNINHSHEDSGKALAPKISISPRITNSFHLF-----DDPSIP	539
CeMTRR	R-----IGDKVOVLGKEPARFLRPLPGMTKNSAGKL	529
HsCPR	RAKE-----PVGENGGRALVPMFVRKSQFLPFK-----ATTP	527
	
	NADPH	
HsMTRR	IIMVGPGTGIAPFIGFLOHREKLOEHPDGNFGAMW-LFFGCRHKDRDYL	588
CeMTRR	LLMVGPGTGVSVFLSFLHFLRKLDKSPSDFDVDPVRLFFGCRDSSVDAI	579
HsCPR	VIMVGPGTGVAPFIGFIOERAWLROOGKE---VGETLLYYGCRSDEDYL	574
	
	NADPH NADPH	
HsMTRR	FRKELRHLKLGILTHLKVSFSRDAPVGEEAPAKYVQDNILHGOOVAR	638
CeMTRR	YHSELEMFVSEGLITDLIICESE-----KGERVODGLRKYLDKVL	621
HsCPR	YREELAQHRDGLATOLNVAFSRE-----QSHKYVVOHLLKODREHLWK	618
	
	NADPH	
HsMTRR	ILLOE-NGHIYVCGDAKNMAKDVDHALVOIISKEVGVKLEAMKTLATLK	687
CeMTRR	FLTASTESKIFICGDAKGMSKDVQCFSDIVASDOGIPDLAEKKLMDLK	671
HsCPR	LI--EGGAHIYVCGDARNMARDVONTFYDIAELGAMEHAQAVDYIKLM	666
	
	NADPH/FAD	
HsMTRR	E EKRYLQDIWS 698	
CeMTRR	KSDOYIEDVWG 682	
HsCPR	TKGRYSLDWS 677	

FIG. 5A

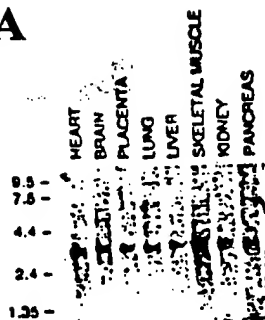


FIG. 5B



060780" 442260



FIG. 6

FIG. 8A

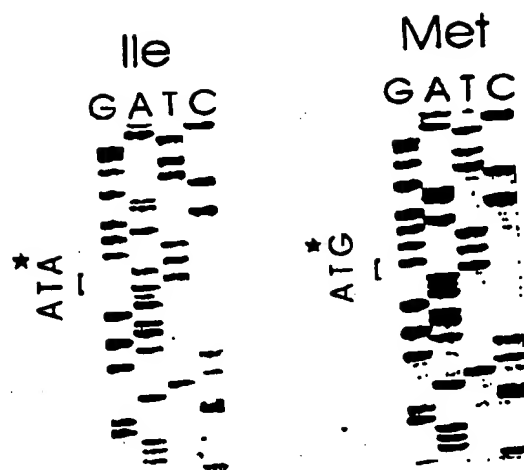


FIG. 8B

